

CLAIMS

1. A DC-DC converter comprising:

an error detection section that outputs an error signal based on the error between the voltage corresponding to the output voltage and a first reference voltage;

5 a pulse-width modulation section that outputs a pulse-width modulation signal having a duty ratio corresponding to said error signal output from said error detection section;

an operating mode control section that compares the input voltage with a second reference voltage and switches the operating mode from a first mode to a second mode corresponding to the result of said comparison;

10 a switching section that performs a switching operation corresponding to said pulse-width modulation signal and holds the output voltage to a prescribed value in the operating mode set by said operating mode control section;

and a correction section that corrects the duty ratio of said pulse-width modulation signal and suppresses variations in said output voltage when said operating mode is switched.

15 2. The DC-DC converter of Claim 1 wherein

said pulse-width modulating section is comprised of a comparator that compares the modulation reference signal generated corresponding to said error signal with an AC signal having a prescribed period, and outputs said pulse-width modulation signal having the desired duty ratio corresponding to the result of said comparison.

20 3. The DC-DC converter of Claim 2 wherein

said correction section adjusts the level of said modulation reference signal corresponding to the signal that controls the switching of the operating mode.

4. The DC-DC converter of Claim 2 wherein

said correction section adjusts the level of said modulation reference signal in a prescribed time corresponding to the signal that controls the switching of the operating mode.

5. The DC-DC converter of Claim 2 wherein

5 said correction section generates a pulse signal of prescribed width, and adjusts the level of said modulation reference signal corresponding to said pulse signal.

6. A DC-DC converter drive circuit comprising:

a first switching element connected between a first power source voltage terminal and one terminal of an inductive element;

10 a second switching element connected between said one terminal of said inductive element and a second power source voltage terminal;

a third switching element connected between the other terminal of said inductive element and a voltage output terminal;

15 a fourth switching element connected between said other terminal of said inductive element and a second power source voltage terminal;

an output capacitor connected to said voltage output terminal, the drive circuit drives said first, second, third, and fourth switching elements of the DC-DC converter, wherein said drive circuit comprises:

20 an error output section that compares the voltage corresponding to the output voltage of said voltage output terminal with a first reference voltage, and outputs an error signal;

a pulse-width modulation signal generator that compares the control voltage corresponding to said error signal with an AC signal of prescribed frequency, and generates a pulse-width modulation signal;

a mode control signal output section that compares the voltage input to said first power source voltage terminal with a second reference voltage, and outputs a first mode control signal or a second mode control signal;

a drive section which operates such that in said first mode, said third switching element is turned on while said fourth switching element is turned off, and, corresponding to said pulse-width modulation signal, said first switching element and said second switching element are turned on alternately, and, in said second mode, corresponding to said pulse-width modulation signal, said first and fourth switching elements and said second and third switching elements are turned on alternately;

and a correction section that changes said control voltage corresponding to variations in said mode control signal.

7. The drive circuit of Claim 6 wherein

said correction section lowers said control voltage corresponding to a change from said first mode to said second mode.

8. The drive circuit of Claim 7 wherein

said first mode is the back mode, and said second mode is the boost mode.

9. The drive circuit described in Claim 6 wherein

said pulse-width modulation signal generator includes a transistor with which said error signal is input to the control terminal, a resistive element that is connected in series with said transistor and generates said control voltage which corresponds to the current sourced by the transistor, and a comparator to which is input said control voltage and a sawtooth signal and that generates said pulse-width modulation signal;

and said correction section has a switching circuit section to which is connected said resistive element and which turns on in response to said mode control signal.

10. The drive circuit described in Claim 9 wherein

5 said drive section includes first, second, third and fourth drivers that drive said first, second, third, and fourth switching elements, respectively, and supplies said pulse-width modulation signal only to said first and second drivers when said first mode control signal is input from said mode control signal output section.